Report and Recommendations

to the

Minister of Environment and Labour

for

The Environmental Assessment

Highway 104 at Antigonish

Submitted by:

Nova Scotia Environmental Assessment Board
Highway 104 at Antigonish Hearing Panel
August 6, 2005

NOVA SCOTIA
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Friday, 5 August 2005

Honourable Kerry Morash
Minister
Nova Scotia Department of Environment and Labour
5151 Terminal Road
Halifax, NS

Dear Minister Morash:

The Hearing Panel of the Nova Scotia Environmental Assessment Board is pleased to present its Final Report and Recommendations regarding the Highway 104 at Antigonish Project of the Nova Scotia Department of Transportation and Public Works. This project was referred to the Environmental Assessment Board on April 18, 2005.

Four hearing sessions were held in Antigonish on June 23 and 24, 2005. The members of the Environmental Assessment Board's Hearing Panel were Tony Blouin, Bonnie Rankin and Dale Smith.

The Panel recommends that the proposed project should proceed, subject to the recommendations as presented in this Report.

We would be pleased to meet with you should any questions arise concerning any comments or recommendations in this Report.

Respectfully submitted,

Tony Blouin, PhD, Chair

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ACKNOWLEDGMENTS

The Nova Scotia Environmental Assessment Board and Hearing Panel members wish to acknowledge the participation, professionalism and courtesy of the formal interveners, members of the public, and representatives of the proponent at the Environmental Assessment hearings in Antigonish. The Chair and Panel members also wish to acknowledge the following individuals for their role in the hearings for the *Highway 104 at Antigonish* project: Mr. Jim Gordon, Nova Scotia Department of Environment & Labour, Nova Scotia Environmental Assessment Board Administrator, for support throughout the process; Mr. Stephen McGrath, Nova Scotia Department of Justice, for legal advice to the Panel; Ms. Carole MacDonald, administrative support for report preparation; and Ms. Farah El Ayoubi for administrative support at the hearings.

RECOMMENDATIONS

The Environmental Assessment Board submits the following Recommendations. A discussion of the issues leading to these recommendations can be found in the body of this Report (Sections 5 and 6).

Atmospheric Air Quality and Noise (5.1)

- That the proponent implement a dust monitoring program to identify and address concerns raised by the community during construction.

- That the proponent consider an engineered noise mitigation solution at the Dunn's Loop location, if an underpass is not feasible (see Section 5.10) and, that any such initiative be undertaken in consultation with affected adjacent landowners.

Groundwater Resources (5.2)

- That further investigation be conducted to identify potential for karst topography along the alignment, especially at the locations of any structures.

- That property owners within the Right of Way be made aware that raising concerns of water quality and quantity following construction activities is their responsibility, and that a complaints mechanism for wells that have permanent loss of water quantity or quality be provided to affected property owners.

- That a detailed groundwater monitoring plan, acceptable to the Nova Scotia Department of Environment and Labour, be developed after the pre-construction survey and prior to construction.

- That the salt management strategy should include water wells as "salt vulnerable areas".

Fish and Fish Habitat (5.3)

- That, as a general principle, stream crossings be located in areas of more consistent gradient and naturally straighter stream character; this principle to be stated within the Environmental Protection Plan for this project.

Rare Herpetiles (5.4)

- That the proponent incorporate a suitable level of field survey follow-up monitoring in the wood turtle risk management plan.

- That a copy of the wood turtle risk management plan, and results of any field surveys, be provided to Environment Canada.

Mammals and Critical Habitat (5.5)

- That the Nova Scotia Department of Transportation and Public Works, in consultation with the Nova Scotia Department of Natural Resources, consider preservation of natural vegetation buffers along all watercourse or road crossings, through extended span lengths, arch culverts, or other means, to facilitate wildlife movement.

Rare Plants and Plant Communities (5.7)

- That the proponent consult with the Nova Scotia Department of Natural Resources and the Nova Scotia Department of Environment and Labour regarding the methods and level of habitat restoration and preservation as well as the amount of suitable land to be purchased under the habitat enhancement program. Every effort should be made to successfully conclude the purchase of suitable lands.

Wetlands (5.8)

- That the proponent consult with Environment Canada, as an expert federal department, on the preparation of the wetland compensation plan, and make reasonable efforts to reach agreement on plan provisions.

- That further field survey be undertaken following detailed design work, to define the areas and extent of project impact on wetlands.

- That, if the field study and detailed design reveal that impairment of hydrologic function or damage to wetland habitat results, the wetland compensation plan include replacement of hydrologic function and/or habitat, as appropriate.

- That, if wetland habitat is constructed, the wetland's water quality function be preserved, and follow-up monitoring including a functional analysis be conducted on the created habitat.

Local Economy (5.9)

- That the strategic planning process for new economic growth be open and transparent, and that it be locally-based and designed to engage the widest possible range of effective involvement by agencies, organizations, businesses and individuals considered to be stakeholders in the context of such a process.

- That the community liaison committee be created, that it focus specifically on subject matter relating to the construction and operational phases of the new highway project, and that it be linked with any broader strategic planning processes relating to community growth and development to the extent deemed necessary and appropriate.

Land Use (5.10)

- That, in the event that a final decision is taken for the new highway to cross the existing Highway 104 by means of an overpass, that the proponent take all reasonable measures to mitigate impacts on affected lands including the James Fraser Dunn property at Dunn's Loop and, in cases in which mitigation proves insufficient, that the proponent consider compensation.

- That all adjacent property owners, where major adverse effects can be anticipated, be dealt with according to the same standard (i.e. as in the immediately preceding Recommendation).

- That every reasonable effort be made to acquire land adjacent to the northern and currently used portion of the St. Ninian's Cemetery Care Company property as compensation for those portions of the cemetery's property that are identified to become incorporated into the new highway alignment or severed by the new highway alignment, and that, in the event it may not be possible to acquire land adjacent to Saint Ninian's Cemetery, construction of a tunnel under the proposed highway be given careful consideration.

Archaeological and Heritage Resources (5.11)

- That the proponent develop a contingency plan to ensure that procedures are in place to ensure appropriate response in the event that archaeological or heritage resources may be encountered during the construction phase of the project.

- That the proponent communicate and consult with representatives of the Mi'kmaq community regarding present day uses of lands, water and resources in the study area that may be affected by the project.

Transportation Infrastructure (5.12)

- That the Kell and Cunningham roads remain connected to Church Street Extension via a tunnel, as the least disruptive approach to mitigating the impacts of the proposed new highway on the referenced local roads.

- That, during (or before) the detailed design phase of the project, the proponent carefully evaluate the option of constructing an underpass where the new highway alignment is proposed to cross the existing Highway 104 in the vicinity of Dunn's Loop, and further, that unless demonstrated conclusively to be infeasible due to accepted design standards or cost, this option be adopted as the preferred course of action.

Major Observations and Concerns (6)

- That, as a confirmation of commitments made in the Environmental Assessment Report, a condition of Ministerial approval for the project should be that all mitigative and follow-up or monitoring commitments made within the Environmental Assessment Report must be implemented as described, and to the satisfaction of Nova Scotia Department of Environment and Labour.

- That Ministerial approval for this project be contingent on submission by the proponent of an Environmental Protection Plan acceptable to Nova Scotia Department of Environment and Labour, prior to initiation of any site work.

- That the proponent provide to Nova Scotia Department of Environment and Labour, prior to initiation of any site work, a dispute resolution policy acceptable to Nova Scotia Department of Environment and Labour, to include an appropriate level of proponent involvement with the community liaison committee in achieving resolution of disputes relating to the project.

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SECTION 1 INTRODUCTION

In April, 2005, the Minister of Environment and Labour accepted the Environmental Assessment Report (EA Report) entitled *Environmental Assessment, Highway 104 at Antigonish*. The proposed highway is a Class II project as defined in *the Environmental Assessment Regulations, Schedule A*. (Class II projects include any highway longer than 10 kilometres and comprising four or more lanes). The Minister, complying with the *Nova Scotia Environment Act*, referred the report to the Nova Scotia Environmental Assessment Board.

The Nova Scotia Environmental Assessment Board (NSEAB) is required to:

- review the environmental assessment report referred to the Board by the Minister;
- consult with the public in accordance with this Act;
- recommend to the Minister the approval or rejection of a project, or conditions that ought to be imposed upon a project if it proceeds; and
- perform such other functions and exercise such powers as may be assigned to, or conferred upon, the Board by the Governor in Council or the Minister.

This report of the Nova Scotia Environmental Assessment Board is the conclusion of the Board's review of the *Environmental Assessment, Highway 104 at Antigonish*, as presented by the proponent, the Nova Scotia Department of Transportation and Public Works (NSDTPW).

This project is also subject to a screening review under the *Canadian Environmental Assessment Act* (*CEAA*). The Environmental Assessment Report currently under review will also be used to satisfy the federal process. Although coordinated, the federal and provincial processes remain independent.

SECTION 2 LEGISLATIVE / REGULATORY FRAMEWORK

The Nova Scotia Environmental Assessment Board is a statutorily created body with duties, authority, and procedures set out in the *Environment Act, Environmental Assessment Regulations,* and *Environmental Assessment Board Regulations.*

The duties of the NSEAB are set out in section 43 of the Environment Act and include, under section 43(a), review of an environmental-assessment report with respect to an undertaking referred to the Board by the Minister in accordance with the directions of the Minister.

Upon referral of the EA Report, to the NSEAB, the Board must conduct public consultation in the review of the EA Report pursuant to section 44 of the *Environment Act* and in accordance with the regulations, as follows:

> "44 (1) In reviewing an environmental-assessment report pursuant to section 43, the Board shall consult with the public by inviting written submissions from the public, by conducting a public hearing or review or in such other manner as determined by the Board."

Finally, the NSEAB is required, pursuant to section 39(1) of the *Environment Act*, to submit a report and recommendation to the Minister no later than 110 days following the date of referral to the Board. Final approval of the project is at the discretion of the Minister.

SECTION 3 A BRIEF HISTORY OF THE PROJECT

The current Highway 104, from Addington Forks to Taylor Road near Antigonish, with its uncontrolled access and mixture of local and through traffic, has the highest collision rate in Nova Scotia for 100 Series highways.

Work on designing a new highway to comply with 100 Series highway regulations began in 1996. Consultations with the public at that time resulted in three options for a new route:

- The Red alignment replaced a portion of the existing Highway 104 and maintained the visibility and access to local businesses.
- The Blue alignment, quite similar to the Red, was located between 300 and 600 m south of the existing highway.
- The Brown alignment, would have been located 2-3 km south of the existing Highway 104.

Various assessments and studies confirmed the Blue route to be the safest of the three.

In 2001, a project description was developed for federal and provincial environmental assessments and the project was registered for provincial environmental assessment. Terms of reference for the assessment were issued, and in 2002, a consultant was hired to conduct the environmental assessment. The consultant's report was accepted by the Nova Scotia Department of Transportation and Public Works (NSTPW, also referred to as "the proponent" in this document) in April of 2005. Also in April of 2005, NSTPW, in compliance with regulations for a Class II project, submitted its *Environmental Assessment, Highway 104 at Antigonish* to the Minister of Environment and Labour. On April 18, 2005, the Minister of Environment and Labour referred the matter to the Environmental Assessment Board (see Appendix A).

The five member Board (see Appendix C) convened a three person Panel; Tony Blouin (Chair), Bonnie Rankin and Dale Smith, to carry out the requirements of the legislation.

Notice of the process and the public hearings (see Appendix B) was published in *The Royal Gazette*, *The Halifax Chronicle Herald* and *The Antigonish Casket*. Four public hearings were held at the Claymore Inn in Antigonish on June 23 and 24, 2005, including one afternoon and one evening session each day. Approximately 40 people attended the public hearings. There were presentations from three interveners and the proponent, and several comments from the public. The Panel also received written comments from four interested parties (see Appendix F).

In preparation for the hearings, the Panel conducted a site visit on June 14, 2005 accompanied by Mr. Dwayne Cross, representing the proponent.

A public record containing the EA report, submissions and other documents relating to the hearings was made available for viewing both at the Nova Scotia Department of Environment and Labour (NSDEL) Library in Halifax, and at the NSDEL District Office in Antigonish.

SECTION 4 DESCRIPTION OF THE PROPOSED ANTIGONISH HIGHWAY 104

The proposed project parallels the existing Highway 104 in Antigonish County between Addington Forks Road (west of Exit 31) and Taylor Road (west of Exit 35). The project involves the proposed construction, operation and maintenance of an approximately 15 kilometre (km) fully controlled access, four-lane divided highway by the proponent, the Nova Scotia Department of Transportation and Public Works.

The divided highway would have a design speed of 120 km/hour. The proposed width of the right of way is 150 m. Commencing at the westerly point, just before Addington Forks Road meets the existing Highway 104, the proposed alignment travels easterly crossing Trunk 4, West River and Beech Hill between 300 m and 600 m south of the existing highway at Antigonish. Just west of the South River bridge, the route crosses from the south to the north side of the existing Highway 104, continuing to where it joins the existing highway at Taylor Road.

Interchanges are proposed at Addington Forks Road, Trunk 7, Beech Hill Road and the extension of Route 316 in Lower South River. The proposed highway will have controlled access with no at-grade intersections or driveways. The existing South Side Harbour Road access to Highway 104 will be severed, and this roadway will be relocated to the Route 316 interchange. An overpass crossing without direct access is proposed at Taylor Road. There are two major water crossings located at West River and South River, and a number of smaller water crossings requiring culvert installations.

The existing highway between Addington Forks Road and Taylor Road is a two/four lane highway with frequent residential and commercial driveways and several at-grade intersections. Posted speed limits are as low as 60 km/hr. Two lane controlled access highways generally have speed limits of 100 km/hr. The existing highway's maximum posted limit does not exceed 90 km/hr.

The mix of the slower, typically local traffic, with the faster through traffic combines to create a public safety hazard. At the Panel hearings, staff of the Department of Transportation and Public Works stated that the speed differential within this corridor has resulted in the highest collision rates in Nova Scotia for 100 Series highways. The traffic volume is the second highest in the province for 100 Series, 2 lane highways.

The proponent has proposed construction of the new Highway 104 route which the Department of Transportation and Public Works indicates would best serve the transportation and economic development needs of the community and province, and which provides the greatest safety. The Environmental Assessment Report for the alignment was prepared for the proponent by Jacques Whitford. The environmental planning was broad enough in scope to consider all factors, including socio-economic considerations.

Conditional upon funding, construction is proposed to start no earlier than the spring of 2008, although land acquisition has been underway for some time. As the new highway would be part of the National Highway System, construction would be eligible for cost-sharing with the Federal

Government. As the forecasted cost estimate for the highway is currently nearing $ 90 million, the proponent indicates that the 15 km alignment will be proposed to be constructed in two phases, approximately equal in length, with the more westerly segment proceeding first.

SECTION 5 ENVIRONMENTAL EFFECTS ASSESSMENT

Please note that information in the subsections entitled "Summary of Environmental Effects / Mitigations / Follow-up and Monitoring" are extracted from the Nova Scotia Department of Transportation and Public Works' *Environmental Assessment Highway 104 at Antigonish*. Table references in the following sections also refer to the EA Report. Finally, references to "undertakings" within this section refer to instances in which the proponent agreed to provide further written comment on particular issues raised at the hearings.

5.1 Atmospheric– Air Quality and Noise

5.1.1 Introduction

Atmospheric resources, including air quality and noise, are considered in this report due to their intrinsic importance to the health and well being of humans, wildlife and vegetation. Air quality concerns include dust generation from construction activities as well as vehicle emissions. Noise concerns include construction activities as well as traffic.

5.1.2 Summary of Environmental Effects / Mitigations / Follow-up and Monitoring

Environmental effects on atmospheric resources as a result of highway construction activities such as clearing, grubbing, and blasting as well as highway operation and maintenance are expected to be:

Environmental Effects (Tables 5.5 and 5.6)
Construction

- Dust generation and construction vehicle exhaust
- Air and dust emissions
- Noise emissions

Operation and Maintenance
Vehicle emissions

- Increased noise levels at residences, businesses and recreational areas

Mitigations

Mitigation measures to address these impacts are: (Tables 5.5, 5.6, and 12.1)

Construction

- Standard dust control procedures (e.g. adherence to standard practices as outlined in the Environmental Code of Good Practice for General Construction (Environment Canada 1979) and the Environmental Code for Good Practice for Highways and Railways (Storgaard and

Associates 1979), application of water spray on exposed areas)
- Complaint Resolution Policy
- Clean up mud and dirt from paved roadways
- Noise controls (e.g. reducing amount of equipment and/or continuous time working in one place, landowner notification, keeping equipment in good working order including mufflers)
- Restricted working hours

In addition, it is noted at page 56 of the EA Report that the number and distribution of equipment during construction will allow for sufficient dispersion of emissions.

Operation and Maintenance
- No mitigation proposed for vehicle emissions
- Noise mitigation at sites 5 and 8

It is noted at page 61 of the EA Report that mitigation of noise at site 8 (Dunn's Loop) will include consideration of construction of an underpass rather than an overpass at this location, thereby utilizing the embankments as a barrier, although this option may not be cost effective. Alternatively, an engineered barrier on the overpass structure will also be considered.

Follow-up and Monitoring

Follow-up and monitoring for atmospheric resources consists of the following (Table 12.1):
- Dust monitoring as required to respond to community concerns

5.1.3 Concerns Identified

From Interveners: Mr. James Fraser Dunn raised concerns about dust generation during construction and noise during highway operation. Mr. Dunn made specific references both in his written submission and his presentation to the significant amount of dust generated when the current highway was built near his property in the 1950's.

From the Public: None.

Written Submissions:
Concerns about air quality were raised by the Canadian Environmental Assessment Agency (CEAA), in particular, greenhouse gas emissions resulting from increased vehicle speed and idling of construction vehicles. CEAA suggested reducing idling of construction vehicles and inclusion of low shrubs in re-vegetation to accelerate carbon uptake. CEAA also noted that the contribution to emissions from asphalt plants used for the project should be included in emissions estimates.

5.1.4 Panel Findings

The Panel had concern regarding the level of commitment given in the EA Report to noise mitigation. The EA Report noted at page 57 that noise mitigation will be considered for houses within 100 m of the Right of Way (RoW) if necessary. The Nova Scotia Department of Transportation and Public Works indicated that the department has no noise mitigation policy. However, it will use geometric design to reduce noise as much as possible. The Panel endorses

this approach. The proponent also pointed out the RoW on this project is 150 m, with the normal RoW being 100 m, therefore creating a greater buffer zone and noise control.

The Panel had specific concerns regarding the commitment to noise mitigation at the Dunn's Loop site, if an underpass is not feasible. The proponent indicated that an engineered Jersey-type barrier as the railing component on the overpass structure might provide some level of noise mitigation at Dunn's Loop and that this request would be included for consideration in the structural design of the overpass, with the feasibility of such mitigation to be determined at the design phase.

5.1.5 Recommendations

- That the proponent implement a dust monitoring program to identify and address concerns raised by the community during construction.

- That the proponent consider an engineered noise mitigation solution at the Dunn's Loop location, if an underpass is not feasible (see 5.10) and that any such initiative be undertaken in consultation with affected adjacent landowners.

5.2 Groundwater Resources

5.2.1 Introduction

Groundwater resources are considered a valued environmental component as the potable water supply to all unserviced residences in the project area. Groundwater and surface water resources interact in Nova Scotia, with groundwater proving the base flow during dry periods and surface water contributing to groundwater stores under appropriate conditions

5.2.2 Summary of Effects / Mitigations / Follow-up and Monitoring

Environmental Effects (Tables 5.11 and 5.12)
Environmental effects on groundwater resources as a result of activities such as highway construction, operation, and maintenance are predicted to be:

Construction
- Loss of well yield
- Water level lowering in shallow dug or drilled wells
- Temporary siltation

In addition, accidental releases of fuel chemicals and loss of or damage to drilled wells during blasting were identified as concerns.

- Operation and Maintenance
- Water quality degradation
- Siltation

Specifically, it is noted that changes in groundwater quality could result from road-runoff and

accidental spills of hazardous substances on the highway.

Mitigations
Mitigation measures proposed to address these impacts are: (Tables 5.11, 5.12 and .12.1)
Construction

- Avoidance of blasting to the extent possible within 500 m of residential wells and the Lower South River well field
- Use ripping techniques where possible
- Pre-blast survey
- Monitoring and remedial action as necessary to restore damaged wells and /or provide temporary potable water as needed
- Measures will be taken to minimize sedimentation and erosion potential
- Minimal exposure of slate bedrock or water table lowering

Operation and Maintenance

- Remedial action as necessary to restore damaged wells and /or provide temporary potable water as needed
- Apply drainage controls
- Drainage and vibration controls

Follow-up and Monitoring (Table 12.1)
Follow-up and monitoring for groundwater resources consists of the following:

- Pre-construction well water survey and follow-up water level monitoring as required
- Blast monitoring
- Monitoring of dug wells during and following construction to ensure quality and quantity

5.2.3 Identified Concerns

From Interveners: None

From the Public: Ms. Marilyn Milner requested that the well monitoring program include residential wells in the Cunningham Road area, where she lives.

Written Submissions:
CEAA noted a likely error of terminology at page 67 of the EA Report where a reference made to spills to "mineralized" bedrock should read "fractured" bedrock. Otherwise, spills to mineralized rocks should also be considered in the EA Report.

The Nova Scotia Department of Environment and Labour (NSDEL), along with the Municipality of the County of Antigonish noted concerns with potable water supply wells. Construction techniques in areas of wells could lead to vibration damage, and water quality could be compromised due to salt runoff. A detailed groundwater monitoring plan acceptable to NSDEL should be developed after the pre-construction survey and prior to construction. A complaint resolution plan, including monitoring and contingency plans for wells that have permanent loss of quantity or quality should be submitted. The salt management strategy should include water wells as "salt vulnerable areas".

5.2.4 Panel Findings

Throughout the public hearings and written submissions from provincial departments, concerns were raised about the potential for the development of karst topography in the project area. The authors of the EA Report did not find evidence of karst, however, anecdotal evidence given by Mr. Dunn, as well as the NSDEL submission indicates the presence of karst. In responses to submissions, the proponent has indicated that further investigation regarding the potential for karst may be warranted. The Panel concurs.

In response to hearing undertaking #13, the proponent indicates that pre-blast surveys are conducted by the contractor, in accordance with NSDTPW standard procedure. Additionally, at undertaking #13 the proponent confirms that a well field contingency plan will be developed.

Follow-up and monitoring of water wells will be the responsibility of the property owner, as per standard practice for the proponent.

5.2.5 Recommendations:

- That further investigation be conducted to identify potential for karst topography along the alignment, especially at the locations of any structures.

- That property owners within the RoW be made aware that raising concerns of water quality and quantity following construction activities is their responsibility, and that a complaints mechanism for wells that have permanent loss of water quantity or quality be provided to affected property owners.

- That a detailed groundwater monitoring plan, acceptable to the NSDEL, be developed after the pre-construction survey and prior to construction.

- That the salt management strategy should include water wells as "salt vulnerable areas".

5.3 Fish and Fish Habitat

5.3.1 Introduction

The proposed project RoW crosses 16 watercourses. Resident and migrating fish populations may be impacted by disturbance adjacent to or within any watercourse, including the effects of runoff from any site disturbance. Some soils in the area are known to be erodible, making adequate erosion and sedimentation controls particularly important. Within the project area, Brierley Brook, West River and South River are noted as including important habitat for various fish species including Atlantic Salmon. In addition to sedimentation, in-stream disturbance and alteration of hydrologic regime may be important sources of impacts. Direct fish mortality may result, or through loss of spawning and feeding habitats.

5.3.2 Summary of Effects / Mitigations / Follow-up and Monitoring

Environmental Effects

Effects of the project on fish and fish habitat from activities such as clearing and grubbing, excavation and infilling, watercourse crossings and culverts, vegetation controls and road de-icing, are anticipated to be (Tables 5.14, 5.15):

- Erosion and sedimentation
- Alteration of riparian habitat
- Acidic drainage
- Blast percussion
- Habitat disruption
- Displacement of fish
- Chemical pollution of watercourse
- Alteration of riparian habitat
- Runoff of salt into watercourses; osmotic stress of fish

Mitigation

Mitigation measures proposed to address these impacts are (Tables 5.14, 5.15, 12.1):

Construction

- Erosion and sediment control
- Adherence to the Environmental Protection Plan
- Establish 75 m buffer zone to exclude grubbing and grading until crossing structures are installed
- Acid drainage risk testing during geotechnical program; application of management program if necessary
- Monitoring (suspended solids; acid drainage parameters if necessary)
- Exclusion of fish from area
- Acidic drainage management if necessary
- Adherence to Fisheries and Oceans Canada's (DFO) guidelines for blasting near watercourses (Wright and Hopky 1998)
- Schedule in-stream work between June 1 and Sept. 30
- Habitat compensation for Harmful Alteration, Disruption or Destruction
- Habitat restoration
- Appropriate crossing method to minimize flow disruption
- Culvert designs requiring fish passage to be reviewed by DFO
- Culvert alignment and sizing to accommodate fish passage as per DFO Guidelines
- Schedule in-stream activities between June 1 and Sept. 30

Operation and Maintenance

- No application of herbicides:
  1) within 30 m of any watercourse;
  2) prescribed on product label; and
  3) within 60 m of a protected water supply.
- Installation of permanent erosion and sediment control measures
- Adherence to sediment and erosion control measures and vegetation management plans detailed in the EPP
- Maintenance of a vegetated buffer zone around watercourses
- Wet salt prior to application to reduce amount required
- Implement Salt Management Strategy

Follow-up and Monitoring

Follow-up and monitoring measures for fish and fish habitat are (Table 12.1):

- Surface water quality monitoring during construction for total suspended solids and acid rock drainage as required
- Follow-up inspections to evaluate site and habitat restoration, bank protection and stability, and to ensure culvert installation allows fish passage where required

5.3.3 Identified Concerns

From Interveners: Mr. James Dunn identified concerns regarding the identified crossing point at South River, in regard to the potential impacts on environmentally sensitive areas in the vicinity such as the saltwater estuary. He questioned why alternative crossing points have not been similarly investigated within the scope of the EA Report. Mr. Dunn stated that the chosen crossing location requires placement of bridge abutments and piers within the estuary, and he does not agree with the EA Report statement that the chosen location is less likely to have significant environmental impacts than alternate sites. Mr. Dunn anticipates difficulty installing piers within the River back channel due to the substrate nature, and environmental impacts as a result. Mr. Dunn's concerns, while not specifically directed at fish or fish habitat, are by implication relevant to this topic at the proposed South River crossing point.

From Public: No additional concerns were raised in respect to fish or fish habitat.

Written Submissions:
Federal authorities provided written comments, some of which related to fish and/or fish habitat. However, these comments were made in the context of the federal response to the EA Report under the CEAA process. The proponent's responses to these comments will be made within the CEAA review process, and do not form part of the Panel review under the provincial EA process. The Panel did not find it necessary to highlight any of the federal comments regarding fish or fish habitat for response during the Hearing.

5.3.4 Panel Findings

In many places in the EA Report, mitigations are described in terms of measures that may be considered, without firm commitments, or the EA Report suggests that multiple options exist

without committing to a specific course of action. This renders it difficult for the Panel to adequately judge the likely impact of the project in such a case, or to assess the differential impacts of multiple options. The proponent has explained that, at this stage of project planning, detailed design information is sometimes not yet available, making final choice of options or mitigation measures impossible. This is understandable at this phase of the project, and is not uncommon in the context of environmental assessment. However, in some cases the result may be that the Panel finds it necessary to recommend a particular option or course of action, where feasible, as a way of ensuring minimal impact.

For example, at stream crossing #11 (location ref. 8+150), the EA Report states that good fish and wood turtle habitat exist, and an arch culvert crossing structure will be considered to facilitate both fish and wildlife passage. In follow-up written responses to questions raised at the Hearing, NSTPW indicated it is prepared to make a commitment to use an arch culvert at this location, and the Panel endorses this decision.

The proponent has also indicated that, where a watercourse crossing may disrupt fish or fish habitat, a HADD (Harmful Alteration, Disruption or Destruction) authorization may be required from Fisheries and Oceans Canada (DFO), which involves satisfying DFO requirements for mitigation or compensation, based on the final design details.

The EA Report recommends that stream crossings be located in areas of more consistent gradient and naturally straighter stream character, to significantly decrease adverse impacts to fish and fish habitat. While this mitigation approach was not included in Table 5.14, the Panel endorses this approach, and would expect the proponent to pursue it whenever feasible. This approach should be mentioned in the Environmental Protection Plan (EPP) for this project.

The Panel notes a possible typo in the second mitigation relating to herbicides which likely should read "except as" prescribed on the product label.

Follow-up and monitoring measures as described in the EA Report should be carried out as described.

5.3.5 Recommendation

- That, as a general principle, stream crossings be located in areas of more consistent gradient and naturally straighter stream character; this principle to be stated within the Environmental Protection Plan for this project.

5.4 Rare Herpetiles

5.4.1 Introduction

Rare and sensitive herpetiles (reptiles and amphibians) are considered due to their importance in preserving biodiversity. While only one turtle species (snapping turtle) was noted during the field survey, suitable habitat for eastern painted turtle and wood turtle was noted. Frog, toad and

salamander species were noted during the field survey, and habitat was suitable for some additional species.

5.4.2 Summary of Effects / Mitigations / Follow-up and Monitoring

Environmental Effects

Effects on rare herpetiles from activities such as clearing and grubbing near riparian zones, blasting, excavation, construction and the presence of the highway and traffic are predicted to be (Tables 5.16, 5.17):

Construction
- Direct mortalities
- Habitat loss

Operation and Maintenance
- Direct mortality
- Removal of wood turtles
- Habitat fragmentation
- Inhibition of dispersal

Mitigation
Mitigation methods to address these impacts are (Tables 5.16, 5.17, 12.1):

Construction
- Conduct wood turtle presence/absence surveys
- Construction worker training and wood turtle relocation
- Consideration of design modifications to structures (if necessary) at Stream Crossing No. 11 (e.g., open bottom culvert) at West River and at South River to accommodate wildlife corridors

Operation and Maintenance
- Consideration (as part of construction) of wildlife corridors at stream crossings (South River, West River and Stream Crossing No. 11)
- Public awareness campaign to decrease turtle strikes on road, and removal of turtles from habitat
- Wood turtle surveys and implementation of a wood turtle risk management plan

Follow-up and Monitoring
Follow-up and monitoring provisions for rare herpetiles are (Table 12.1):
- Development of a wood turtle risk management program by NSTPW in coordination with NSDNR at the South River and the West River and its unnamed tributary at 8+150 (Stream Crossing No. 11)

5.4.3 Identified Concerns

From Interveners: None.

From Public: None.

Written submissions:
Federal authorities noted that the Wood Turtle is listed as a species of concern in Canada, and advocated a precautionary approach including reducing or avoiding impacts, and monitoring of any effects. Environment Canada asked that it be kept informed of the results of surveys conducted under the Wood Turtle Risk Management Plan, and asked for a copy of this plan. Department staff also asked that mitigation measures as recommended by NSDNR be enforced.

NSDNR noted in a written submission that the proponent has committed to consult NSDNR on appropriate mitigation measures for bridge construction, and that this is acceptable.

The Nova Scotia Department of Tourism, Culture and Heritage noted that avoidance of species at risk, and their habitat, is the most important conservation strategy.

5.4.4 Panel Findings

The EA Report provides a commitment to conduct a pre-construction survey program at the proper time of year for wood turtles, with relocation as necessary if individuals are found. There is also a commitment to prepare a wood turtle risk management plan, in collaboration with NSDNR, for the South River, West River, and stream crossing #11. It was previously noted that, in written response to Panel questions, NSDTPW has made a commitment to use an arch culvert at stream crossing #11 to facilitate wildlife passage, which will benefit wood turtles. There is also a commitment to consult with NSDNR on appropriate mitigative design for watercourse crossing structures. The Panel endorses these commitments.

The EA Report provides an indication that incidental follow-up monitoring may be incorporated to increase knowledge of wood turtles in the study area.

5.4.5 Recommendations

- That the proponent incorporate a suitable level of field survey follow-up monitoring in the wood turtle risk management plan.

- That a copy of the wood turtle risk management plan, and results of any field surveys, be provided to Environment Canada.

5.5 Rare Mammals and Critical Habitat

5.5.1 Introduction

Rare and sensitive mammal species and their habitat are environmentally important for the preservation of biodiversity. A number of species of large and small mammals are known to exist within the study area, based on field survey and records, in spite of significant disturbance

and altered habitat in a number of areas. None of the recorded species is considered rare in Canada or Nova Scotia, but the little brown and northern long-eared bats are considered sensitive, and likely occur in the study area. No critical habitat areas were reported to exist within the study area.

5.5.2 Summary of Effects / Mitigations / Follow-up and Monitoring

Environmental Effects

Effects on rare mammals and critical habitat from activities such as clearing, blasting, excavation, construction, and traffic are predicted to be (Tables 5.18, 5.19):

Construction

- Habitat loss
- Direct mortality of small mammals
- Sensory disturbance

Operation and Maintenance

- Sensory disturbance
- Direct mortality associated with vehicle collision
- Habitat fragmentation

Mitigation

Mitigation methods to address these impacts are (Tables 5.18, 5.19, 12.1):

Construction

- Minimize vegetation clearing as practical for RoW preparation

Operation and Maintenance

- Consider longer bridge spans to preserve vegetative fringe for wildlife travel routes

Monitoring and Follow-up

No monitoring or follow-up measures for rare mammals and critical habitat were proposed in the EA Report.

5.5.3 Identified Concerns

From Interveners: None.

From Public: Ms. Marilyn Milner, expressed concern about the impact of the proposed West River bridge on wildlife resident in this area (specific reference was to bird species).

Written submissions:
NSDNR noted that, while no federally or provincially listed rare or endangered species occur within the immediate highway footprint, a number of species listed as of "conservation concern" do occur.

The Nova Scotia Museum noted that tree-roosting bats have been reported in the area, and may use foraging and nursery habitat within the study area.

5.5.4 Panel Findings

The EA Report notes that the need for and design of wildlife underpasses will be considered after the alignment and interchange locations are finalized, and after consultation with NSDNR. The Panel endorses this commitment. It is also noted that a commitment has been made to use an arch (open bottom) culvert at stream crossing #11 (ref. Section 5.3), which may benefit wildlife movement at this location.

The EA Report also notes that one mitigation for possible roadkill would be a longer span than normal at watercourses and road crossings, to preserve a fringe of natural vegetation which might facilitate wildlife travel. No specific commitment was made in this regard.

5.5.5 Recommendations

- That NSDTPW, in consultation with the NSDNR, consider preservation of natural vegetation buffers along all watercourse or road crossings, through extended span lengths, arch culverts, or other means, to facilitate wildlife movement.

5.6 Rare and Sensitive Birds

5.6.1 Introduction

Rare bird species are of importance in the preservation of diversity. Sensitive bird species (those particularly affected by human activity or disturbance) are those such as birds of prey, which are important for the ecological role they play in the food web.

Historical records show 143 bird species recorded in total in the general project area. Eighteen of these are considered uncommon or rare, or sensitive to human activity, including a number of raptor species. Seventy-nine bird species were recorded during the breeding bird field survey.

5.6.2 Summary of Effects / Mitigations / Follow-up and Monitoring

Environmental Effects

Effects on rare and sensitive bird species as a result of activities such as clearing, grubbing, blasting, excavation, sub-grade construction, traffic and RoW maintenance are predicted to be (Tables 5.20, 5.21):

- Sensory disturbance
- Habitat fragmentation and creation of edge habitat
- Loss of breeding habitat and nesting sites
- Mortality associated with collisions
- Destruction of nests of ground-nesting species

Creation of a linear corridor will result in creation of edge habitat, which can support increased numbers and diversity of birds, but which also support predators and nest parasitic birds such as brown-headed cowbirds. Net effect of edge habitat may be mixed positive and negative.

Mitigation

Mitigation measures to address these impacts are (Tables 5.20, 5.21, 12.1):

Construction

- Schedule clearing, grubbing, and grading to avoid breeding seasons
- Minimize the width of the cleared RoW
- Establish 200 m radius buffer zones around Osprey nests near route within which no construction is permitted

Operation and Maintenance

- Identify and mark minimum safe working area around bridge pier construction sites; approach roads to these sites will avoid habitat suitable for Nelson's Sharp-tailed Sparrow
- Where feasible, do not mow cleared RoW between April 1 and August 1 to avoid destruction of the nests of ground nesting species such as Bobolink
- Implement NSDTPW's Integrated Roadside Vegetation Management program to reduce the necessity of mowing and brush cutting

Follow-up and Monitoring

No monitoring or follow-up provisions are proposed for rare and sensitive birds.

5.6.3 Identified Concerns

From Interveners: None.

From the Public: Ms. Marilyn Milner expressed concern over the West River crossing, and the effect on eagles, blue heron and osprey resident in the area.

Written submissions:

Federal authorities noted that the *Migratory Birds Convention Act* protects not just bird nests, but

the birds themselves. This prohibits killing or any type of hunting, including harassment. Breeding seasons vary by species, and this should be considered for appropriate mitigation such as avoiding breeding seasons for clearing and grubbing. Cumulative impacts of vehicle collisions with other pressures on bird populations should be considered.

5.6.4 Panel Findings

The EA Report indicates that the RoW will not be mowed until the end of July if feasible, in order to avoid destruction of the nests of ground nesting species. In written response to a question, the proponent indicated that every effort will be made in this regard, but operational requirements may make this impossible on occasion. The Panel finds that this is reasonable, but expects that diligent efforts will be made. The Panel endorses the other mitigation commitments made in the EA Report.

5.6.5 Recommendations

None specific to rare and sensitive birds.

5.7 Rare Plants and Plant Communities

5.7.1 Introduction

Rare plants are important in preservation of biodiversity. They may also be indicators of rare habitats, which may support a unique suite of plant and animal species due to a unique set of environmental conditions. Thus, preservation of rare plants may also contribute to preservation of a number of unique species, and preserve the function of the habitat and communities which depend upon it.

Based on historical records, 14 rare or uncommon plant species were known to occur in the general vicinity. Field survey revealed an additional 9 uncommon species within the project area. Suitable habitat for most of these species exists within the project area. A number of species of interest were found in the intervale habitat (intervale: low-lying land, especially along a river) along the West River, some close to the crossing site. This intervale habitat was itself considered to be uncommon, but has been subject to past disturbance.

The coastal freshwater marsh at South River is also an uncommon habitat type, providing important and productive habitat for a variety of plants and animals.

5.7.2 Summary of Effects / Mitigations / Follow-up and Monitoring

Environmental Effects

Effects on rare plants and plant communities as a result of activities such as clearing and grubbing, sub-grade and bridge construction, RoW vegetation maintenance and road de-icing are predicted to be (Tables 5.24, 5.25):

Construction

- Mortality of existing plants
- Loss and disturbance of rich intervale habitat

Operation and Maintenance

- Mortality of existing plants
- Degradation of habitat

Mitigation

Mitigation measures to address these effects are (Tables 5.24, 5.25, 12.1):

(Note: the preferred mitigation - to shift RoW to avoid rare or sensitive plants (shift RoW 125 m north at West River, 100 m south to avoid black ash at 12 + 700) - is not feasible given the presence of other constraints)

Construction

Minimize width of RoW to be cleared within mature climax and climax dominated forest

Black Ash

- Plant black ash seedlings to replace the ash sapling lost to highway construction;
- Replacement trees will be monitored for at least four years before onset of construction

Purple Milkweed

- Avoid clearing portion of Wetland 2 that is located within the RoW but outside of the footprint of the highway

Water Loosestrife

- Carefully place and size culverts to ensure that the hydrology of the Brierly Brook wetland (Wetland 1) is not altered

Marsh Mermaid-weed

- At Brierly Brook wetland (1) minimize wetland infilling
- Carefully place and size culverts to ensure that the hydrology of the Brierly Brook wetland (Wetland 1) is not altered
- Infill only the amount of wetland habitat required to construct a safe roadbed;
- Carefully place and size culverts to ensure that the hydrology of Wetland 1 is not altered
- Coffee-tinker's Weed, Canada Lily, Wood Nettle, Bloodroot
- Design the bridge structure to minimize the amount of intervale habitat disturbed by the bridge
- Plan the bridge pier construction sites to minimize the amount of habitat disturbed
- Implement an intervale enhancement program to improve habitat quality and increase populations of sensitive species

Rich Intervale Habitat at West River

- Design the bridge structure to minimize the amount of intervale habitat disturbed by the bridge
- Plan the bridge pier construction sites to minimize the amount of habitat disturbed
- Implement an intervale enhancement program to improve habitat quality and increase populations of sensitive species

Operation and Maintenance
Purple Milkweed
- Avoid mowing or brush cutting wetland habitat at Wetland 2 that is located within the RoW

Coffee-tinker's Weed, Canada Lily, Wood Nettle, and Bloodroot
- Direct bridge drainage away from areas where rare or uncommon species are present
- Minimize brine and brine contaminated slush and snow thrown over the side of the bridge by snow plows and other vehicles
- Identify the West River section where these species occur as a salt sensitive area to be a candidate for pre-wetting and anti-icing agents to reduce exposure to salt laden runoff

Follow-up and Monitoring

Follow-up and monitoring for rare plants and plant communities consists of (Table 12.1):
- Monitor abundance and distributions populations of rare and uncommon plant species at West River crossing site as part of intervale habitat enhancement program

5.7.3 Identified Concerns

From Interveners: Mr. James Fraser Dunn expressed concern about the impacts of the South River bridge crossing on the saltwater estuary as an environmentally sensitive area (although not specific to rare plant species), and asked whether alternate crossing locations had been considered. Proponent response at the hearing included discussion of the alignment selection process and consideration of some alternatives.

From the Public: Ms. Marilyn Milner expressed concern regarding the impact of the West River bridge crossing on the intervale habitat. Discussion at the hearing reviewed provisions in the EA Report relating to the habitat enhancement program and bridge design.

Written Submissions:
Federal authorities questioned whether all avoidance possibilities have been explored for the West River crossing, such as moving the bridge location. The proponent's response was that intervale habitat exists both to the north and south of the proposed location, so moving the crossing may not be effective, and that a number of considerations resulted in the chosen location and alignment.

Federal authorities also questioned the amount of intervale habitat to be purchased for restoration and protection, and whether affected plant species occur on such lands.

NSDNR asked that the proponent meet with NSDEL and NSDNR staff to discuss the recommended method and level of compensation to be considered for riverine or riparian habitat.

It was noted by the Nova Scotia Department of Tourism, Culture and Heritage, Heritage Division, that NSDNR has downgraded the status of coffee-tinkers weed from red to yellow.

5.7.4 Panel Findings

The habitat enhancement program at West River will be particularly important for preserving at least some of the plant diversity and habitat now present at this site. The EA Report notes that this habitat enhancement program should be underway prior to initiating construction of the bridge at West River, and at the hearing the proponent confirmed the commitment to do so. It is also noted that the design of the bridge will influence the degree of impact, and that locating the bridge abutments at the base of the river bank slopes to leave the intervale habitat undisturbed would be a particularly effective mitigation. Construction practices should ensure that the intervale habitat is disturbed as little as possible.

Transplantation is mentioned as a possible mitigative measure. However, at the hearing it was acknowledged that NSDNR's position is that this is a last resort when avoidance is not possible. The proponent made a commitment to consult with NSDNR regarding appropriate methods, and indicated that follow-up monitoring would routinely be part of such a transplantation program to ensure success.

As part of the habitat enhancement program, the proponent indicated that they will consider purchasing intervale land immediately north and south of the RoW at the West River crossing, to be restored and protected. On questioning at the hearing, the proponent confirmed that this would be done, if possible. It will be important for appropriate authorities (NSDEL, NSDNR) to be involved in determining appropriate amounts and locations of suitable intervale habitat for purchase.

The restoration program would include planting seed of rare species such as the coffee-tinker's weed to increase the local population. The EA Report indicates that no mowing or brush clearing is to be conducted in the intervale habitat where identified species occur. Adherence to the road salt management plan will also assist in plant habitat protection. Follow-up monitoring of populations of rare or uncommon plants at the West River crossing site is to be a part of the habitat enhancement program.

The Panel endorses the mitigation measures outlined in the EA Report, and the commitments specified above.

5.7.5 Recommendations

- That the proponent consult with the NSDNR and NSDEL regarding the methods and level of habitat restoration and preservation as well as the amount of suitable land to be purchased under the habitat enhancement program. Every effort should be made to successfully conclude the purchase of suitable lands.

5.8 Wetlands

5.8.1 Introduction

Wetlands are important as habitat for a number of species of plants and animals, some of which are considered rare in the project area. Wetlands also play an important role in improving water quality, and reducing variations in flow rate of water passing though them. Wetlands are highly productive habitats and important contributors to biodiversity.

5.8.2 Summary of Effects / Mitigations / Follow-Up And Monitoring

Twenty-one wetlands are located within the proposed Hwy 104 RoW. Of these, 10 were judged by the EA Report not to have any anticipated significant effects as a result of the project. One wetland had already been infilled. Of the remaining ten, four (#s 1, 6, 10, and 15) were judged to have a role in regulating surface water flow. This function was not predicted to be significantly impacted, provided care is taken not to alter wetland hydrology. Wetlands 11 and 12 have similar hydrologic functions, but are not predicted to be significantly impacted. Wetlands 1, 2, 10, 15 and 17 provide habitat for uncommon plant species, but impacts are not predicted to be significant except for wetland 17, where habitat and thus the small population (one plant, purple-fringed orchid) will be lost. This is considered acceptable, as the species is otherwise secure in Nova Scotia. Wetlands 6 and 19 provide some level of surface water quality treatment. This function is not predicted to be significantly impacted. Wetland 21 provides significant migratory bird and fish habitat, which is not predicted to be significantly impacted. A significant adverse effect is defined as a net loss of wetland function in a wetland determined to be of significant value through a recognized wetland evaluation system. The EA Report indicates that, provided the proposed mitigative measures are applied, no significant adverse impacts are anticipated during construction or operations.

Environmental Effects

Effects on wetlands due to activities such as clearing, grubbing, blasting, excavation, sub-grade construction, traffic and road de-icing are predicted to be (Tables 5.27, 5.28):

Construction
Wetlands in General
- Habitat loss/alteration
- Increased erosion leading to sedimentation
- Alteration of hydrologic regime
- Loss of wetland functional attributes

Wetlands 1, 6, 11 and 12
- Loss of hydrologic function (surface water retention and flood control)

Wetlands 1, 2, 6, 7 and 19
- Loss of water quality function

Wetlands 1, 2, 10, 15, and 17
- Presence of uncommon plant species

Wetland 21
- Habitat loss/alteration
- Loss of hydrologic function (Protection from tidal flooding)
- Loss of recreational opportunities (interruption of spring sports fishing and wildlife viewing opportunities)
- Loss of Sharp-tailed Sparrow breeding habitat (sensitive species)
- Disturbance of breeding Sharptailed Sparrows
- Sedimentation of wetland and estuarine habitat

Operation and Maintenance
- Mortality of wetland wildlife associated with vehicle interactions
- Sensory disturbance to wildlife
- Increased salinity to wetland

Mitigations

Proposed mitigations to address these impacts are as follows (Tables 5.27, 5.28, 12.1):

Construction
Wetlands (General)
- Avoid wetland habitat wherever feasible.
- Where avoidance is not feasible, construct replacement wetland habitat capable of replacing loss of wetland functions.
- Implement erosion control measures.
- Design the highway and associated drainage system to avoid altering wetland hydrology.

Wetlands 1, 6, 11 and 12
- Salvage wetland soils from disturbed wetland habitat and incorporate into replacement wetland habitat to speed establishment of plant communities.

Wetlands 1, 2, 6, 7 and 19
- Salvage wetland soils from disturbed wetland habitat and incorporate into replacement wetland habitat to speed establishment of plant communities.
- Test salvaged soil to ensure that toxic concentrations of contaminants will not be released when the soil is moved.

Wetlands 1,2,10, 15, and 17
- Minimize the amount of wetland habitat affected by clearing, grubbing and infilling only the portion of the wetland required for construction of the road bed.

Wetland 21
- Design bridge structure to minimize the amount of habitat affected.
- Minimize infilling of flood plain to maintain flood storage function and minimize loss of

terrestrial habitat.

- Align the bridge structure perpendicular to the river and at the narrowest point.
- Locate the bridge as close as possible to the existing structure to minimize the footprint and disturbance of wildlife.

Operation & Maintenance

- Consider construction of wildlife corridors at watercourse crossing sites (at Wetland 11) to reduce the incidence of roadkill.

Mitigation measures to reduce sedimentation and erosion are listed in the EA Report. A commitment is made to implement NSDTPW's Salt Management Strategy as outlined in EA Report Appendix L. The use of wildlife corridors such as arch-structure (open-bottom culvert) crossings will be considered.

Follow-Up and Monitoring

Follow-up and monitoring provisions for wetlands are (Table 12.1):

- Development of Wetland Compensation Plan
- If applicable, monitoring and functional analysis of replacement wetland habitat to determine if constructed wetlands are suitable compensation

The EA Report includes a commitment to develop a wetland compensation plan. This plan may consider replacing the hydrologic functions of the wetlands through creation of wetland habitat along the margins of damaged wetlands or along the same drainage course, equal to or greater in size than the wetland habitat lost. If wetland habitat is to be replaced, then it is recommended that wetland habitat be constructed to maintain existing water quality function. If wetland habitat is constructed, a monitoring program will be established. After a suitable growing period, a wetland functional analysis will be conducted to determine if the constructed wetland(s) has developed the functional attributes deemed necessary to compensate for the loss of functional attributes in the original wetland.

5.8.3 Identified Concerns

From Interveners: None.

From Public: None.

Written Submissions:
Environment Canada requests that it be consulted on preparation of the wetland compensation plan.

5.8.4 Panel Findings

It was not clear in the EA Report if a firm commitment was made to the sedimentation and erosion control measures listed on page 177. The proponents indicated that the commitment is to implement standard NSDTPW procedures. It was also not clear if there is a firm commitment

under the wetland compensation plan to replace lost hydrologic functions and damaged habitat, and undertake monitoring. The proponents indicated that further design detail is required to define the roadway footprint and thus the impacts. The commitment is to consult with NSDNR and NSDEL, and federal authorities if federal jurisdiction is involved, in preparing the plan. A field survey and more detailed mapping, to be done following detailed design, will further define the impacted areas.

While it is understandable that, at this stage of project planning, detailed design work has not been completed, it is important to understand the specific commitments and options which will, or will not, be implemented. If a specific commitment cannot be made, then the proponent should clearly indicate what other options will be considered, under what conditions or criteria they would be implemented, and what different environmental impacts (if any) would result, and what mitigation methods and measures would be applied. Only with such indication can the residual impacts be fully understood and evaluated.

Mitigation measures to reduce sedimentation and erosion, as listed in the EA Report, should be implemented. The proponent has confirmed that an arch culvert structure will be used at stream crossing #11, as recommended in the EA Report.

5.8.5 Recommendations

- That the proponent consult with Environment Canada, as an expert federal department, on the preparation of the wetland compensation plan, and make reasonable efforts to reach agreement on plan provisions.

- That further field survey be undertaken following detailed design work, to define the areas and extent of project impact on wetlands.

- That, if the field study and detailed design reveal that impairment of hydrologic function or damage to wetland habitat results, then the wetland compensation plan include replacement of hydrologic function and/or habitat, as appropriate.

- That, if wetland habitat is constructed, then the wetland's water quality function be preserved, and follow-up monitoring including a functional analysis be conducted on the created habitat.

5.9 Local Economy

5.9.1 Introduction

The local economy is treated as a valued socioeconomic component in recognition of concerns that the proposed new highway alignment could effectively by-pass existing businesses and lead to reductions in the customer base, business revenues and business tax income. Also of interest are potentially positive opportunities for commercial, residential and industrial development that could be created as a result of the creation of the new highway.

5.9.2 Summary of Effects / Mitigations / Follow-up and Monitoring

Environmental Effects

Effects on the local economy anticipated by the proponent are summarized in Tables 6.13 and 6.14 of the EA Report, and listed below.

Construction

- Loss of resource land from production
- Disrupted access to recreational lands and commercial areas
- Job creation and increased disposable income

Operation and Maintenance

- Decrease in through traffic (increased safety and decreased traffic congestion) along existing Highway 104
- Decrease in customer base at commercial operations along existing Highway 104
- Opening new areas for commercial, residential and industrial development due to increased access
- Improved regional transportation system and access to tourism and recreational facilities

Mitigation

Mitigation measures proposed by the proponent to address these effects include the following (from Tables 6.13, 6.14 and 12.1):

Construction

- Open and early communication with landowners
- Adequate planning time
- Purchase of land parcels / land swap
- Fair and reasonable compensation
- Liaison/information through Community Liaison Committee and municipal officials to reduce disruption and promote economic planning
- Traffic Management
- Underpass/overpass design to maintain or improve access where practical

Operation and Maintenance

- Ongoing liaison and monitoring through Community Liaison Committee
- Appropriate signage, lighting, landscape design at interchanges

- Explore construction of a visible Visitor Information Centre
- Strategic planning for the new economic growth

Follow-up and Monitoring

The proponent commits to the establishment of a community liaison committee to monitor the project during the construction phase to ensure that access to businesses and other establishments is adequately maintained and that signage is provided as necessary. This committee would also monitor effects over the long term and report their findings to the NSDTPW and to municipal officials, who will determine jointly if remedial action is required (Table 12.1).

5.9.3 Identified Concerns

From Interveners: Mr. Hugh L. MacDougall presented a submission on behalf of the Blue Route Re-alignment Committee which supports the proposed new highway alignment. The committee urged the proponent to move forward with project implementation from the perspective of traffic safety. The submission pointed out that the recent economic growth experienced by the Antigonish area overlaps with the period of time when the new highway alignment was in the planning stages, and emphasized the need for a broad base of community involvement.

From the Public: Mr. Sean Day, Town Planner for the Town of Antigonish, spoke about the economic impact of moving Highway 104 southward, away from business establishments in the Town. Specific mention was made to loss of business visibility in the James Street area, particularly the proposed interchange between the new highway and Trunk 7.

Written Submissions:

The Department of Tourism, Culture and Heritage recognized the potential for the new highway alignment to impact on the accommodation and food sector due to a reduction in through traffic and decreased business visibility. However, the Department also acknowledged safety concerns associated with current traffic levels and indicated that a safe and efficient system of controlled-access highways is an imperative of the tourism industry. The Department supported the approach of mitigating potential impacts on local tourism-oriented businesses through such measures as signage and the relocation of the Visitor Information Centre to a more prominent location accessible from the proposed new highway alignment.

5.9.4 Panel Findings

The Panel understands and accepts that the new highway alignment is required in light of current traffic volumes that significantly exceed the capacity of the existing Highway 104. In so doing, the Panel also recognizes that the new alignment will result in both positive and negative effects on the local economy. In particular, businesses that are highly dependant on through traffic are likely to experience adverse effects, especially over the short term until a period of adjustment has passed. At the same time, the establishment of the new highway will afford new opportunities for growth and development along the existing Highway 104, and at selected locations in the vicinity of interchanges on the new highway.

The Panel supports the mitigation measures proposed by the proponent to ameliorate the effects

of potential increases in pass-through traffic. Effective signage and a strategically placed visitor information centre, as proposed for one of the major new interchanges, are considered reasonable responses. More generally, the Proponent has indicated that a community liaison committee will be established to monitor progress during the construction and operational phases. In describing the committee's mandate, specific references are made to signage, issues relating to access, the relocation of the Visitor Information Centre, and measures to encourage economic development in Antigonish.

It is noted that Table 6.14 makes reference to "strategic planning for new economic growth" as a mitigation. However, it is not clear how this process would be implemented, and a number of questions remain outstanding:1) Where would the responsibility lie?; 2) What parties would participate?; 3)Will strategic planning be a public process?; 4) Is it intended that this effort be undertaken through, or in association with, the community liaison committee (CLC).

While recognizing that the new highway project may act as a catalyst for such a process, it is the Panel's opinion that strategic planning for community economic growth, or for community development more generally, is wider in scope than strategic issues relating to the new highway development, and that these considerations should bear directly on the design of structures and processes for this committee.

5.9.5 Recommendations

- That the strategic planning process for new economic growth be open and transparent, and that it be locally-based and designed to engage the widest possible range of effective involvement by agencies, organizations, businesses and individuals considered to be stakeholders in the context of such a process.

- That the CLC be created, that it focus specifically on subject matter relating to the construction and operational phases of the new highway project, and that it be linked with any broader strategic planning processes relating to community growth and development to the extent deemed necessary and appropriate.

5.10 Land Use

5.10.1 Introduction

The construction and realignment of a 100 Series highway can affect a wide variety of land uses adjacent to both the original and new highway alignments. In assessing effects, the proponent considered the following land uses: residential, commercial, industrial, resource (i.e. agricultural and forestry) and recreational.

5.10.2 Summary of Effects / Mitigations / Monitoring

Environmental Effects
Effects on adjacent land uses anticipated by the proponent are summarized in Tables 6.15 and

6.16 of the EA Report and listed below.

Construction
- Loss of residential and resource land
- Air, dust and noise emissions
- Disrupted access to residential properties, and commercial, industrial, and resource operations

Operation and Maintenance
- Decreased through traffic (increased safety and convenience) along existing Highway 104
- Increased noise levels at residences
- Potentially restricting access to land uses
- Permits new development of lands through improved access

Mitigation
Mitigation measures proposed by the proponent to address these effects include the following (from Tables 6.15, 6.16 and 12.1):

Construction
- Open and early communication with landowners through a CLC and other mechanisms
- Adequate relocation time
- Purchase of land parcels / land swap
- Fair and reasonable compensation
- Maintain access to properties
- Noise and dust controls (Refer to Section 5.1)
- Restricted working hours

Operation and Maintenance
- Traffic management
- Maintain, to the extent possible, existing access roads
- Underpass / overpass design to maintain access
- Negotiate with landowners to realign/construct replacement access roads during construction
- Refer to Section 5.1 for noise mitigation measures

Follow-up and monitoring
The proponent commits to the establishment of a community liaison committee to remain in close consultation with property owners along the right of way to discuss scheduling, temporary and permanent alternate access roads, and to monitor other project elements of concern to local landowners (Table 12.1).

5.10.3 Identified Concerns

From Interveners: Mr. James Fraser Dunn outlined a number of concerns relating to anticipated impacts of the proposed new highway on his property, which is situated adjacent to Dunn's Loop, Lower South River, where the proponent proposes that the new highway will cross the existing Highway 104 by means of an overpass in the immediate vicinity of the Dunn residence. Mr. Dunn's concerns relate to both the construction and operational phases of the project, and include nuisance dust, elevated noise levels, vehicle emissions and negative impacts on the existing view of South River from his property. Mr. Dunn's submission also makes a case for the new highway to cross the existing highway by means of an underpass. Mr. Dunn contends that an underpass would not only ameliorate impacts relating to noise and loss of view, but also offer advantages in terms of highway gradient, safety and cost. Aspects of Mr. Dunn's submission as it relates to the underpass proposal, are further addressed in Section 5.12, Transportation Infrastructure. Although the proponent has indicated that the final determination of whether the crossing will be by overpass or underpass will be made during the final design phase, a preference for an overpass structure has been clearly indicated by the proponent based on the preliminary site information available at this point.

Mr. John Chisholm, President, St. Ninian's Cemetery Care Company expressed concern that the alignment for the proposed highway effectively cuts the cemetery property in two, with the net effect being that some 19 acres would be lost to the highway right of way and 23 acres would be severed from the area currently being used. Mr. Chisholm's submission requested that these 42 acres be replaced by an equivalent amount of land adjacent to the portion of the cemetery property currently in active use. In discussion following Mr. Chisholm's presentation, the proponent agreed to continue negotiations on this matter.

From the Public: Mr. Hugh MacDougall spoke in favour of the acquisition of lands north of the new highway right-of-way and adjacent the cemetery property, essentially as a tradeoff.

Written Submissions:

Mr. Roger J. Hunka, on behalf of the Netukulimkewe'l Commission (Nova Scotia Native Council), expressed the concern that to date there had been insufficient communication with the Mi'kmaq/Aboriginal Peoples Community in regard to the proposed project. Mr. Hunka's submission recommends that "some form of direct communication to the First Nation Community in the area, and the Native Council of Nova Scotia Mi'kmaq/Aboriginal Peoples Community, is an important mitigation measure which must be included in the EAR as a minimum".

5.10.4 Panel Findings

The Panel recognizes that the construction and realignment of a 100 Series highway adjacent to a significant population center will have a wide variety of land use effects, both positive and negative, in relationship to lands situated adjacent to, or accessible from, the existing and the new alignments.

It is also recognized that the Dunn property occupies a very strategic location in relationship to the proposed new highway alignment. Accordingly, it seems clear that the proposed new highway will bring significant adverse effects to bear on this property, particularly if the crossing of the existing Highway 104 is constructed by overpass as currently proposed.

The Panel also recognizes that a number of additional properties will be similarly affected, although perhaps generally not to the same degree.

The Panel concurs that the mitigation measures proposed by the proponent in reference to adjacent land uses and users are reasonable. However, in the case of the Dunn property, and any other adjacent properties where major adverse effects can be anticipated, it is the Panel's opinion that all reasonable efforts should be made to mitigate these effects and, if possible mitigation is found to be insufficient, to provide reasonable compensation.

5.10.5 Recommendations

- That, in the event that a final decision is taken for the new highway to cross the existing Highway 104 by means of an overpass, that the proponent take all reasonable measures to mitigate impacts on affected lands including the Dunn property and, in cases in which mitigation proves insufficient, that the proponent consider appropriate compensation.

- That all adjacent property owners, where major adverse effects can be anticipated, be dealt with according to the same standard (i.e. as in the immediately preceding Recommendation).

- That every reasonable effort be made to acquire land adjacent to the northern and currently used portion of the St. Ninian's Cemetery Care Company property as compensation for those portions of the cemetery's property that are identified to become incorporated into the new highway alignment or severed by the new highway alignment, and that, in the event it may not be possible to acquire land adjacent to Saint Ninian's Cemetery, construction of a tunnel under the proposed highway be given careful consideration.

5.11 Archaeological and Heritage Resources

5.11.1 Introduction

Highway construction involves extensive disturbance of surficial and subsurface materials which could impact negatively on archaeological and heritage resources that may be situated within the new highway alignment. These resources are addressed as a valued socioeconomic component in light of their cultural and educational value.

5.11.2 Summary of Effects / Mitigations / Follow-up and Monitoring

Environmental Effects

Effects on archaeological and heritage resources anticipated by the proponent are summarized in Tables 6.18 and 6.19 of the EA Report, and listed below.

Construction

- Disturbance of any archaeological, heritage or traditional land use resource
- Improved understanding of cultural history

Operation and Maintenance

- Access to adjacent archaeological and heritage resources and vandalism
- Inadvertent disturbance of site surfaces

Mitigation

Mitigation measures proposed by the proponent to address these effects include the following (Tables 6.18, 6.19 and 12.1):

Construction

- Mitigation at the A. Fraser house as directed by the Nova Scotia Museum; may include recording the house with photographs
- Monitoring of the area of the nineteenth century carriage house during construction of the proposed South River crossing

Operation and Maintenance

- No mitigation recommended

Follow-up and Monitoring

The proponent indicates that follow-up for the project will be undertaken at the direction of the Nova Scotia Museum (Table 12.1).

5.11.3 Identified Concerns

From Interveners: Mr. James Fraser Dunn provided information, based on personal recollection and references to family history, census records and a geological map, to support his contention that a Mi'kmaq encampment had existed in the study area. In addition, Mr. Dunn indicated that the historic Fraser residence could be "saved from destruction" by adjusting the proposed Highway curve (between stations 10 +350 and 10+950).

From the Public: None

Written Submissions:

The Nova Scotia Department of Tourism, Culture and Heritage indicates general support for the findings and assignment of significance in relationship to archaeological and heritage resources; however, additional information was requested by way of referencing the pertinent background

report(s) and investigating archaeologist(s). The Department also noted that further archaeological research may be required for the site assigned a moderate significance (A. Fraser house), depending on information submitted in support of the mitigation recommendation that the proponent has committed to prepare.

Mr. Roger J. Hunka, on behalf of the Netukulimkewe'l Commission, highlights the importance of recognizing Mi'kmaq use of lands, waters and resources in the study area, and emphasizes the need for direct communication with the First Nations community as an important mitigation measure. Mr. Hunka also recommends that a "detailed mitigation plan" be prepared in reference to archaeological and heritage resources prior to the commencement of any work or activity on the proposed project.

5.11.4 Panel Findings

Four heritage sites have been identified within the proposed highway alignment, one of which (the A. Fraser house) is rated as having moderate significance. The remaining sites are rated as low. In addition, there is one potential site for which there is an historic record of a carriage house in the vicinity of the proposed South River crossing but for which there is no apparent evidence on the ground. No archeological sites have been identified within the proposed highway right of way.

For the moderately significant site, the proponent proposes that, if deemed appropriate by the Nova Scotia Museum, a mitigation plan be developed in consultation with the Nova Scotia Museum. In regard to archaeological resources that may be encountered during the construction phase, the proponent indicates that work will be halted and immediate contact will be made with the Nova Scotia Museum and the Confederacy of Mainland Mi'kmaq. However, it is noted by the Panel that there is no reference to any such contingency plan in Table 6.15.

The Panel notes that the proponent acknowledges that the project may result in the temporary or permanent loss of hunting/kill sites and of plant species used by Mi'kmaq. However, it concludes that these sites and species occur throughout the wider surrounding area and therefore that these impacts are not significant. The Panel also recognizes the importance of consulting with representatives of the Mi'kmaq community in regard to present-day use of land, water and resources.

5.11.5 Recommendations

- That the proponent develop a contingency plan to ensure that procedures are in place to ensure appropriate response in the event that archaeological or heritage resources may be encountered during the construction phase of the project.

- That the proponent communicate and consult with representatives of the Mi'kmaq community regarding present day uses of lands, water and resources in the study area that may be affected by the project.

5.12 Transportation Infrastructure

5.12.1 Introduction

Transportation infrastructure includes both existing and proposed roads in the study area. Roads are considered as valued socioeconomic components because of their central importance in regard to safe, convenient, economic and efficient travel within the study area.

5.12.2 Summary of Effects / Mitigations / Follow-up and Monitoring

Environmental Effects

Effects on transportation infrastructure anticipated by the proponent are summarized in Tables 6.28 and 6.29 of the EA Report (April, 2005), and listed below.

Construction

- Survey crews working on or near existing roads may affect traffic flow at areas where the proposed alignment crosses or joins existing roads
- Properties will be severed
- Kell and Cunningham Roads will be severed
- Construction traffic will use some area roads
- Construction activities will affect traffic flow at areas where the proposed alignment crosses or joins existing roads
- Construction activities will affect traffic flow at areas adjacent to each site (i.e. overpasses/underpasses/interchanges)
- Temporary detours will be required
- Some construction traffic will occur on area roads
- Traffic flow at west and east ends of the new highway will be affected as connections to the existing highway are completed

Operation and Maintenance

- Diversion of through traffic from existing Highway 104
- Diversion of some local traffic from existing Highway 104
- Potential reduced traffic speeds on existing Highway 104
- Improved ease and safety of access to properties on existing Highway 104

Mitigation

Mitigation measures proposed by the proponent to address these effects include the following (Tables 6.28, 6.29 and 12.1).

Construction

- Adherence to *Nova Scotia Temporary Workplace Traffic Control Manual*
- Alignment location and access roads will minimize impacts to severed properties
- Kell and Cunningham Roads traffic volumes are low and a convenient service road to Trunk 7 will be provided
- Locating paving batch plants adjacent to the new alignment

Operation and Maintenance
- No mitigation proposed

Follow-up and Monitoring

No follow-up and monitoring of impacts on transportation infrastructure, other than periodic traffic counts on the existing Highway 104 and on the new highway (Table 12.1).

5.12.3 Identified Concerns

From Interveners : Mr. Hugh L. MacDougall presented a submission on behalf of the Blue Route Re-alignment Committee supporting the proposed alignment and emphasizing the importance of moving forward with project implementation in respect to infrastructure upgrading and traffic safety.

Mr. Fraser Dunn, of Dunn's Loop, Lower South River, expressed a number of concerns in reference to the alignment and design of the new highway as it is proposed to cross the existing Highway 104 in the immediate vicinity of his residence. Although these concerns (e.g. dust, noise, and loss of view) relate to his situation as an adjacent property owner and have been addressed in a previous section (5.10.3 Land Use), Mr. Dunn's proposal to mitigate these impacts relates directly to transportation infrastructure. In essence, Mr. Dunn proposes that the crossing be by underpass rather than by overpass as is proposed by the proponent. Mr. Dunn contends that, in addition to having less impact on his view and resulting in less highway traffic noise at his residence, the underpass would also have advantages in terms of highway grading, traffic safety, and construction cost.

5.12.4 Panel Findings

The Panel understands the rationale for the proposed project; essentially that demand levels demonstrated by current and projected traffic volumes exceed the capacity of the existing Highway 104 to accommodate the safe and efficient flow of traffic through the Antigonish area. Based on the documentation provided, it is apparent to the Panel that the establishment of the proposed new, higher-standard, four-lane highway and the diversion of through traffic, as well as a considerable proportion of local traffic, to this alignment should benefit both area residents and visitors.

The Panel concurs that the mitigation measures proposed by the proponent are reasonable. It is noted that the proponent indicated, at the hearings, that consideration is being given to adjusting the mitigation proposed for the severance of the current connection of Kell and Cunningham roads with Church Street Extension. The mitigation proposed in the report is that a service road be constructed south of the proposed new highway alignment to connect with Trunk 7. However, at the hearings, the proponent indicated that further work had been done on this issue, and that consideration was being given to maintaining the direct connection with the Church Street Extension by constructing a tunnel under the new highway.

In regard to Mr. Dunn's intervention concerning the appropriate grade-separation structure to enable the proposed new highway to cross over the existing Highway 104, the Panel agrees that the underpass option appears to offer a number of advantages. These include highway gradient, safety and cost, if Mr. Dunn's contentions can be substantiated at the more detailed site survey and final design stages. (As well, the use of an underpass structure would significantly mitigate impacts of concern to Mr. Dunn as an adjacent landowner (Section 5.10.3)). On the other hand, while agreeing with Mr. Dunn on a number of points, the proponent contends that an overpass structure will be dictated by site constraints and associated design standards, and that an overpass would be more cost-effective at this location. This issue is made all the more difficult due to the preliminary stage of the project. Detailed site survey and final design are required before this issue can be finally resolved.

5.12.5 Recommendations

- That the Kell and Cunningham roads remain connected to Church Street Extension via a tunnel, as the least disruptive approach to mitigating the impacts of the proposed new highway on the referenced local roads.

- That, during (or before) the detailed design phase of the project, the proponent carefully evaluate the option of constructing an underpass where the new highway alignment is proposed to cross the existing Highway 104 in the vicinity of Dunn's Loop, and further, that unless demonstrated conclusively to be infeasible due to accepted design standards or cost, this option be adopted as the preferred course of action.

SECTION 6 MAJOR OBSERVATIONS AND CONCERNS

6.1 Introduction

This section addresses subject matter that typically is broader in scope than that of the contents of individual sections, which focus on specific environmental or socioeconomic effects (as addressed in Section 5). The contents that follow consider subjects or concerns that relate to the project or process overall, as well as to major issues that emerged from the review process but which could not be addressed effectively in the preceding section-by-section treatment of specific effects.

6.2 Panel Comments

Public Involvement

The Panel understands and accepts that a new 100 Series highway alignment through the Antigonish area is required in light of current and projected traffic volumes that significantly exceed the capacity of the existing Highway 104. The Panel also recognizes that the proposed new alignment will result in wide-ranging positive and negative environmental and socioeconomic effects. It is further understood that these effects will apply to properties and areas impacted directly by, or situated in the immediate vicinity of, the proposed new alignment and to properties and areas similarly proximate to the existing 104 Highway (i.e. that would be by-passed by the proposed new alignment). Effects also extend to the Antigonish town and county community at large, as well as to communities beyond these local bounds that are, and will continue to be, served by this segment of 100 Series highway (i.e. provincially, regionally and nationally).

It is within this context of wide-ranging effects that the Panel is somewhat concerned about the level of public input and participation at the recent public hearings in Antigonish. In the Panel's estimation and expectation at least, this was somewhat lower than might have been anticipated in light of the nature and scope of real and perceived impacts.

At the same time, it is also recognized that the review of the EA Report, as currently underway, represents but one of a number of steps in a multi-year planning and design process extending from initial project conception and planning to final design and construction. It is further recognized that, earlier in the process, prior opportunities for public review and input were available. These involved extensive debate of some of the more significant and controversial aspects of the project, including route selection and corresponding concerns regarding potential impacts on the local business community. On these occasions, it is understood that issues and concerns were identified and debated extensively, and it may be that, in many minds, resolution has been achieved.

Nevertheless, the Panel remains of the opinion that it is likely that issues and concerns that did not come forward during the current process may well re-emerge later on, when specific opportunities or impacts may become more readily apparent and therefore more easily identified or anticipated.

Unfortunately however, any such issues or concerns would likely be much more difficult for the proponent to respond to should the project progress to increasingly more detailed phases of planning, design, and ultimately the initiation of construction. Such issues could range from concerns about particular segments of the proposed highway alignment and corresponding structures (bridges, overpasses/underpasses), to environmental impacts on significant and/or sensitive areas and sites. Issues could encompass positive and negative effects, during both the construction and operational phases, on adjacent landowners, area businesses, interest groups and individuals. In the opinion of the Panel, these considerations should have an important bearing on the design of public information programs and corresponding provisions for stakeholder input as the project progresses through successive stages of planning and design. The Panel therefore agrees that a strong and effective community liaison committee, as proposed by the proponent, will have an important role to play in these regards.

Highway Planning and Environmental Assessment Processes

Recognizing its inherently iterative nature, the highway planning and design process, which logically must proceed from the general to the specific, was found by the Panel to be particularly challenging. The environmental assessment process occurs somewhere near the mid-point of an overall planning and design continuum. As a result, the environmental assessment is initiated after numerous major decisions, such as the selection of a preferred highway alignment, have been taken. Furthermore, such decisions may be based on relatively general information, and yet, once taken, they become increasingly difficult to revisit as the project progresses and more detailed information becomes available.

A parallel concern is that, where impacts can be foreseen and mitigation measures required, there is often uncertainty if such measures will prove adequate or effective until detailed site survey can be undertaken and final design completed. By this time, options to step back and re-consider basic options or alternatives may be effectively precluded. On more than one occasion, the Panel struggled with the notion that detailed survey and final design may well generate more detailed information and understanding that could bring into question decisions taken at any earlier stages which, at the time, were based on the best information available.

6.3 Identified Concerns

A number of significant and somewhat overlapping issues emerged out of the public hearing process that could not be adequately addressed in the review of specific economic and socioeconomic effects, as undertaken in the preceding sections.

The Dunn's Loop Overpass/Underpass Issue

The issue that received most attention at the public hearing process was the question of whether the existing Highway 104 should be crossed by the new highway by means of an overpass or an underpass. This issue is addressed in Sections 5.10 and 5.12; however, it is referenced again in this section in recognition of it's prominence in the hearing process and of the inability of the primary intervener (Mr. Dunn), the proponent, and the Panel to reach agreement on basic facts.

In fairness, it should be pointed out that this problem is also one that can only be addressed with finality when more detailed site specific and final design information is available.

South River Crossing

A number of submissions expressed concerns about the environmental sensitivity of the South River estuary, and potential impacts at the proposed crossing location (the "Blue route"). The proponent also recognized this potential concern in commissioning a special study to determine the magnitude and extent of environmental impacts, mitigation measures required, and corresponding cost implications (Appendix E, "Highway 104 Antigonish South River Impact Study" as contained in the EA Report).

Another focus of intervention and questioning involved an alternate crossing at a more southerly point, upstream from the proposed crossing and in the vicinity of the "Brown route" alignment. The proponent, however, indicated that while the costs of the two bridge crossings and associated highway segments were more or less comparable (with the caveat that an additional one-half kilometre would be required to complete the southern option), there were significant constraints associated with the highway alignment required to access the southern crossing option (see below). Also, specifically in reference to the bridge structure, because of its proximity to Highway 316 at which an interchange would be required to connect with the existing Highway 104, on and off ramps would extend onto the bridge structure and increase costs of the structure as a result.

Alternate Highway Alignment

Closely associated with discussion of an alternate location for the crossing point of South River is the alternate alignment of the new highway that would be required, from a point (according to the proponent) about a kilometre west of Dunn's Loop to the "Brown route" just before it cross over South River (and beyond to the eastern terminus of the proposed new highway to the east of Taylor Road). This approach, if feasible, would not only avoid impacts on the sensitive crossing point on South River immediately north of the existing Highway 104, but also negate the necessity of crossing the existing highway (whether by overpass or underpass) and the associated impacts and concerns of the adjacent landowner (Mr. Dunn) at this location.

However, the proponent outlined a number of constraints associated with the highway realignment that would be required to access the alternate crossing point. These include the condition of the terrain that would have to be crossed, the steep and difficult approach to the western end of the bridge, the unsuitability of Highway 316 as a connector road to the community of South River (due to the presence of residential development), and the added construction costs noted above in reference to the bridge structure.

6.4 Panel Findings

The Dunn's Loop Overpass/Underpass Issue: The Panel gave very careful consideration to contracting the services of an expert to offer advice on this issue. In the end, however, the Panel concluded that any expert opinion would be hampered by the same constraints deriving from the limited availability of detailed site information at this time, and therefore would be unlikely to offer adequately definitive conclusions.

South River Crossing: In light of the environmental sensitivity and associated concerns about the South River crossing, it is the opinion of the Panel that it could have been more advantageous if the proponent had studied both potential crossing sites at the same level of detail. This approach would have provided comparable information, and could have laid the groundwork for a decision in which there might have been a higher level of confidence and acceptance on the parts of concerned parties. Had the more southerly crossing proved preferable, from an environmental perspective, then the question of the alternate alignment and bridge design could have been considered in this light.

Alternate Highway Alignment: This issue was considered carefully by the Panel and, although it was concluded that significant questions remain outstanding, it was also felt that that the focus of the Panel's deliberations and corresponding recommendations should be on the highway alignment (i.e. the Blue route, and the corresponding South River crossing point) as set out in the project description. In reference to questions regarding impacts of the crossing point, under the circumstances noted above, reliance therefore must be placed on the detailed site survey and design phases to ensure that these impacts are adequately mitigated and monitored as outlined in the EA Report.

It is the Panel's view that decisions taken about the alignment of the highway, and the corresponding crossing point of the South River, were taken at the time of the selection of the preferred highway alignment (the Blue route), and are therefore essentially outside the terms of reference under which the Panel is operating. To reconsider this would effectively disregard the process leading up to the selection of the preferred alignment and, to some extent, pre-judge the mitigation measures that are to be established during the detailed site inventory and design phases. At the same time, the Panel remains concerned that the two alignment options, essentially from a point approximately one kilometer west of Dunn's Loop to their respective South River crossing points, and the crossing points themselves, were not evaluated in parallel and on a completely transparent and comparable basis.

Malfunctions and Accidental Events: The EA Report states that through adherence to the project EPP, and emergency response and contingency procedures, significant environmental effects are not likely to result from malfunctions or accidental events.

The Panel noted that failure of sedimentation controls does occur on large projects, and questioned the statement that this was unlikely. The proponent clarified that it was the occurrence of a significant negative effect as a result that would be considered unlikely. Given that the Panel was unable to review the EPP or any associated contingency procedures, it is

particularly important that specific procedures be put in place to deal with any occurrence of a malfunction or accidental event with regard to sedimentation controls. The EA Report does indicate that the EPP will include a Spill Contingency Plan for the project.

Environmental Management and Monitoring: The EA Report clarifies that the proponent is committed to implementation of all of the environmental design and mitigation measures which are specified throughout the document. In addition, an EPP will be completed prior to construction, and submitted to NSDEL for approval, with circulation to Environment Canada, DFO and other regulatory agencies.

The Panel endorses the commitments specified above. The EA Report makes mention of Environmental Compliance Monitoring (ECM), and indicates that in addition to regulatory surveillance, the proponent will include self-regulatory ECM measures. These may include monitoring of all environmentally sensitive activities, coordination of communication with regulatory authorities, and provision of on-site environmental advice to project personnel. However, the EA Report provides no further detail on the proposed self-monitoring provisions.

Environmental Effects Monitoring (EEM) is also discussed, but again little detail is provided. It is very important that the EPP clearly spells out the nature, extent and details of the ECM and EEM programs for this project. While some indication is provided in the EA Report Table 12.1, no details of the monitoring programs are provided.

The Panel notes that NSDTPW has made a commitment to prepare a number of associated plans and surveys, as components of, or in addition to, the EPP, as follows:

- Wellfield contingency plan
- Wood turtle risk management plan and pre-construction survey
- Intervale enhancement program
- Wetland compensation plan
- Fraser house mitigation plan
- Spill Contingency Plan (as per EPP)
- Intervale (rare plant) habitat enhancement program
- Wetland monitoring program
- Environmental Compliance and Effects Monitoring (as per EPP)
- Public information and involvement program and community liaison committee (including dispute resolution)

Cumulative Effects: The EA Report deals with the cumulative effects of the project and anticipated housing development which may occur as a result of the project, through improved access to developable lands. The EA Report states that environmental effects may result, but that standard mitigative measures will reduce these effects to insignificant levels.

The Panel questioned why residential development had been considered as an induced effect of the project, but not commercial development. The proponent indicated that it is aware of some possible residential development applications, but not of any specific commercial developments. However, the EA Report also states that increased potential for commercial development is an

anticipated effect of the project, and indeed such potential is held out as a possible mitigative result which may help to address negative economic impacts on existing businesses. This again emphasizes the importance of adherence to all mitigative measures in the EPP, to avoid unanticipated cumulative effects.

Public Information Program: The EA Report proposes the establishment of a CLC, and indicates that a dispute resolution policy will be established to deal with complaints and concerns from landowners and stakeholders, to allow the proponent to fulfill the goal of effective and responsible communication.

During the Hearing, the proponent clarified that the CLC is expected to receive input from the community. In subsequent written response, the proponent indicated that the CLC is also expected to establish the dispute resolution mechanism. No further details were available. The Panel considers dispute resolution to be an important aspect of a significant project such as the Highway 104 realignment, and would expect the proponent to have more of a role in dispute resolution. A community committee may be unable to resolve some disputes, or ensure that commitments are carried out.

6.5 Recommendations

- That, as a confirmation of commitments made in the EA Report, a condition of Ministerial approval for the project should be that all mitigative and follow-up or monitoring commitments made within the EA Report must be implemented as described, and to the satisfaction of NSDEL.

- That Ministerial approval for this project be contingent on submission by the proponent of an Environmental Protection Plan acceptable to NSDEL, prior to initiation of any site work.

- That the proponent provide to NSDEL, prior to initiation of any site work, a dispute resolution policy acceptable to NSDEL, to include an appropriate level of proponent involvement with the community liaison committee in achieving resolution of disputes relating to the project.

APPENDIX A:

LETTER OF REFERRAL TO THE NOVA SCOTIA ENVIRONMENTAL ASSESSMENT BOARD

Department of
Environment & Labour

PO Box 697
Halifax, Nova Scotia
B3J 2T8

Our File Number:
10700-40
40100-31-15

Office of the Minister

APR 18 2005

APR 19 2005

Mr. Tony Blouin, Chair
Nova Scotia Environmental Assessment Board
PO Box 1749
Halifax, Nova Scotia
B3J 3A5

Dear Mr. Blouin:

On April 8, 2005, Nova Scotia Department of Transportation and Public Works submitted an Environmental Assessment Report for the Proposed Highway at Antigonish.

I hereby refer the Report to the Environmental Assessment Board for review, in accordance with the *Nova Scotia Environment Act*, the *Environmental Assessment Regulations* and the *Environmental Assessment Board Regulations*. Please submit a report and recommendations to my office by August 6, 2005 in accordance with the *Environmental Assessment Board Regulations*.

Sincerely yours,

Kerry Morash
Minister

APPENDIX B:

NOTICES OF ENVIRONMENTAL ASSESSMENT REPORT RELEASE AND PUBLIC HEARINGS

NOTICE

Release of Environmental Assessment Report Pursuant to the Nova Scotia ENVIRONMENT ACT

This is to advise that on April 8, 2005, the Minister of Environment and Labour received the Environmental Assessment Report for Highway 104 at Antigonish, proposed by Nova Scotia Transportation and Public Works. The Minister has referred the Report to the Environmental Assessment Board for review, in accordance with Part IV of the Environment Act and Section 7 (1) of the Environmental Assessment Board Regulations.

Interested persons may examine the Report at the following locations:

- Town of Antigonish Office, 274 Main St., Antigonish, Nova Scotia
- Antigonish Town Library, Town Office Building, (College St. entrance) Antigonish, Nova Scotia
- Nova Scotia Department of Environment and Labour, Antigonish Office, 219 Main Street, Suite 205, Antigonish, Nova Scotia
- Ecology Action Centre, Suite 31, 1568 Argyle St., Halifax, Nova Scotia
- Clean Nova Scotia, 126 Portland Street, Dartmouth, Nova Scotia
- Nova Scotia Department of Environment and Labour, 5th Floor Library, 5151 Terminal Road, Halifax, Nova Scotia
- The Environmental Assessment Website at www.gov.ns.ca/enla/ess/ea

The public is invited to submit written comments on the Environmental Assessment Report to:

Nova Scotia Environmental Assessment Board
P.O. Box 697, Halifax, NS B3J 2T8
or e-mail at: eab@gov.ns.ca Or Fax at: 424-5640

on or before June 14, 2005.

For more information contact the Administrator, Nova Scotia Environmental Assessment Board, (902) 424-2484.

Information respecting this environmental assessment and public hearings will be available in a public file at the following addresses. All comments received during the hearing, including any personal information, will also be placed in that public file located at:

Department of Environment and Labour Library
Halifax Office
5th floor, 5151 Terminal Rd.

Department of Environment and Labour
Antigonish District Office
219 Main St., Suite 205

NOVA SCOTIA
Environmental Assessment Board

NOTICE

Notice of Hearing
Pursuant to the Nova Scotia
ENVIRONMENT ACT

Notice is hereby given that the Environmental Assessment Board (EAB) for the Province of Nova Scotia will hold public hearing sessions pursuant to the Environmental Assessment Regulations made under Section 49 of the Environment Act, at Antigonish, N.S., regarding the Environmental Assessment for Highway 104 at Antigonish, proposed by Nova Scotia Transportation and Public Works.

Place: Claymore Inn, Antigonish, N.S.

Dates: June 23 & 24, 2005.

Times: Afternoon Sessions - 1:30 p.m. to 4:30 p.m.
Evening Sessions - 7:00 p.m. to 9:30 p.m.

The purpose of the hearing, under Section 8 of the Environmental Assessment Regulations, shall be:

(a) to receive submissions and comments from any interested party;

(b) to ask questions and to seek answers respecting the environmental effects of the undertaking; and

(c) to provide information which will assist the hearing panel in the preparation of its report and recommendations to the Minister.

Any interested parties may attend and make presentations after having notified the undersigned on or before June 9, 2005. Written submissions *for presentation at the hearing* must be received by June 13, 2005, and journals, studies and reports used as reference materials shall be submitted no later than June 16, 2005.

The EAB Administrator may be contacted at:

Nova Scotia Environmental Assessment Board
5151 Terminal Road
P.O. Box 697,
Halifax, N.S. B3J 2T8
or e-mail at eab@gov.ns.ca
or Fax at (902) 424-5640
or Phone (902) 424-2484

Information respecting this environmental assessment and public hearings is available in a public file at the following addresses. All submissions and comments received during the hearing, including any personal information, will also be placed in that public file located at:

Department of Environment and Labour Library
Halifax Office
5th floor, 5151 Terminal Rd.

Department of Environment and Labour
Antigonish District Office
219 Main St., Suite 205

Dated at Halifax, Nova Scotia, this 2nd of May, 2005.

James S. Gordon
Administrator

NOVA SCOTIA
Environmental Assessment Board

APPENDIX C:

MEMBERSHIP OF
NOVA SCOTIA ENVIRONMENTAL ASSESSMENT BOARD AND
HIGHWAY 104 AT ANTIGONISH HEARING PANEL

NOVA SCOTIA ENVIRONMENTAL ASSESSMENT BOARD (EAB)
MEMBERSHIP
(MAY, 2005)

Dr. Anthony C. Blouin, Chair:

Dr. Ray Cranston

Bonnie L. Rankin

Dale Smith

Penny J. Henneberry

MEMBERS EAB HIGHWAY 104 AT ANTIGONISH HEARING PANEL
(MAY, 2005)

Dr. Anthony C. Blouin, Chair

Bonnie L. Rankin

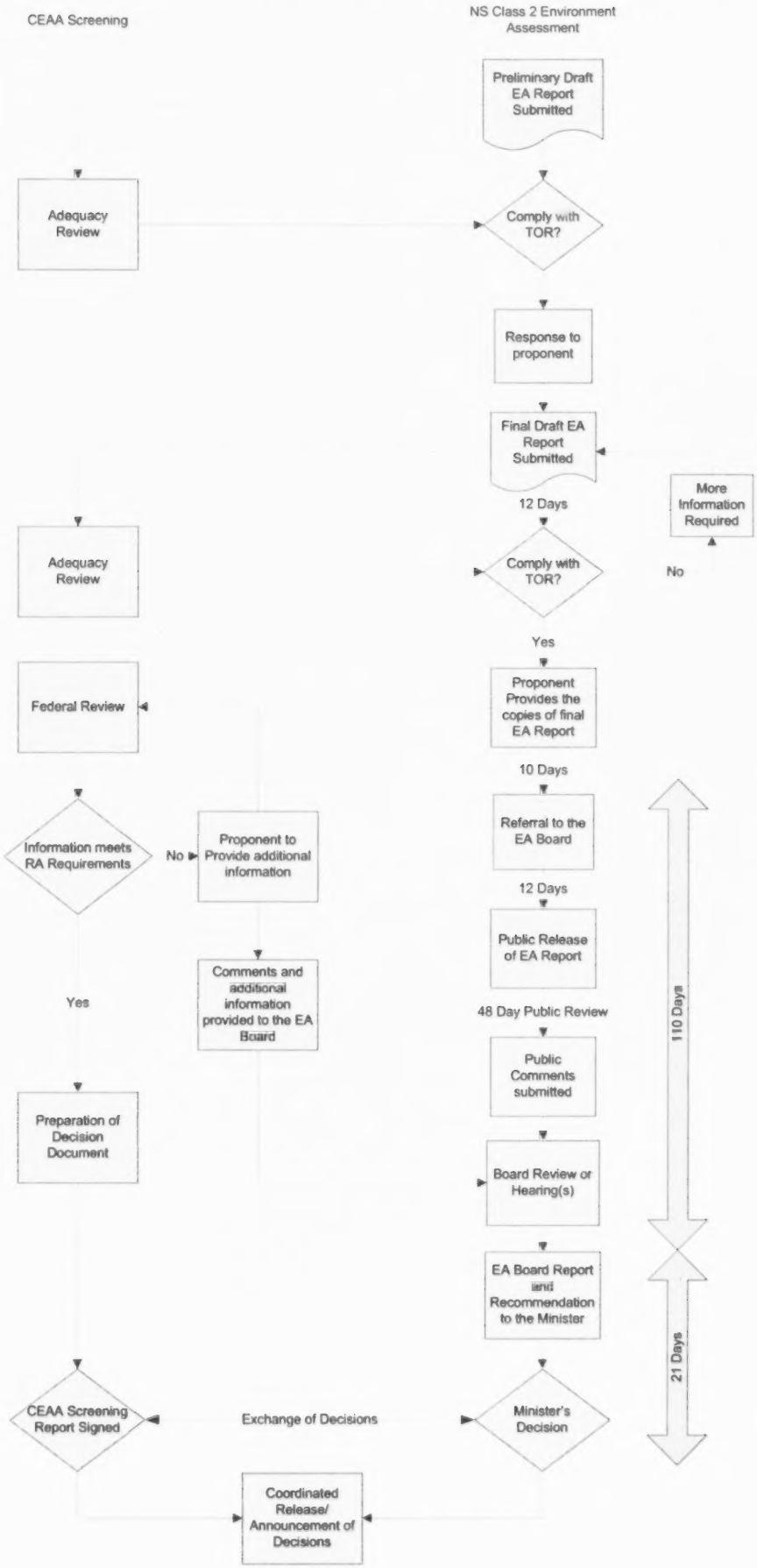
Dale Smith

Penny J. Henneberry (Alternate)

APPENDIX D:

PROJECT FLOW CHART

Highway 104 Harmonized EA Process Following the Finalized Terms of Reference
April 12, 2005



APPENDIX E:

PROJECT CRITICAL DATES

Environmental Assessment Board - Highway 104 Project

Critical Dates

Activity:	Date:
Undertaking registered	November 26, 2001
Final Terms of Reference issued	February 26, 2002
(One year extension requested)	
Draft EA Report submitted	February 26, 2005
Final EA Report submitted	April 8, 2005
Ministerial referral to EA Board	**April 18, 2005**
Requirement for Public Release of EA Report (12 day) - publish notice / release report	**April 30, 2005**
Actual date of release of report	**April 26, 2005**
Actual date of publishing Notice of Release of Report	**April 27, 2005**
Prescribe form / sign the Notice of Hearing (14 days)	**May 2, 2005**
Publication dates for 1st Notice of Hearing	***Chronicle Herald* - May 21, 2005. *Antigonish Casket* and *Royal Gazette* - May 25, 2005.**
Publication dates for 2nd Notice of Hearing	***Chronicle Herald* - May 28, 2005. *Antigonish Casket* and *Royal Gazette* - June 1, 2005.**
Notification deadline to advise Board for hearing interveners	**June 9, 2005**
Hearings submissions deadline	**June 13, 2005**
Deadline for comments from public review (48 days)	**June 14, 2005**
Submission of reference materials for hearing deadline	**June 16, 2005**
1st day of public hearings	**June 23, 2005**
2nd day of public hearings	**June 24, 2005**
Deadline for written arguments / submissions from hearing participants	**July 8, 2005**
Deadline for corrections, errors or omissions in transcript to be reported to EAB Administrator	**July 20, 2005**
Deadline for submission of Report and Recommendations to Minister	**August 6, 2005**

APPENDIX F:

NAMES OF WITNESSES WHO CONTRIBUTED TO THE PUBLIC HEARINGS

NAMES OF WITNESSES WHO CONTRIBUTED TO THE HEARINGS

Proponent representatives:

Dwayne Cross

Phillip Corkum

Robert Federico

Shannan Murphy

Lesley Griffiths

Elizabeth Pugh

Michael Croft

Lester Tingley

Members of the Public:

James Fraser Dunn, Intervener

John Chisholm, representing Saint Ninian's Cemetery Company, Intervener

Hugh L. MacDougall, representing Blue Route Realignment Committee, Intervener

APPENDIX G:

EXHIBIT LIST

Environmental Assessment Board
Highway 104 at Antigonish
Panel Hearings

ENVIRONMENTAL ASSESSMENT BOARD
HIGHWAY 104, ANTIGONISH
June 23 and 24, 2005

EXHIBIT LIST

Exhibit #	Description	Entered By
1	Affidavit of Service of Notice of Hearing	Administrator
2	Schedule of Critical Dates	Administrator
3	Environmental Assessment Report - TPW April 2005	TPW
4	Mr. Dunn's written presentation	James Fraser Dunn
5	Present Photo from Dunn Dwelling	James Fraser Dunn
6	After 104 Highway View from Dunn Dwelling	James Fraser Dunn
7	Profile Drawing Comparing Overpass and Underpass at Dunn's Loop	James Fraser Dunn
8	June 8, 2005 letter from Mr. Chisholm, St. Ninian's Cemetery Care Company	John Chisholm
9	Canadian Environmental Assessment Agency Comments	
10	Provincial Agency Comments	
11	Municipal Comments	
12	Native Council – Mr. Roger Hunka Comments	
13	Plan of Highway 104 Antigonish - February 2004	
14	Written Presentation from the Blue Route re-alignment committee	

APPENDIX H:

BIBLIOGRAPHY OF DOCUMENTS SUBMITTED

Bibliography of Documents and Written Materials Submitted During the Public Hearing Process

The following written materials were received by the Hearing Panel as part of the hearing process:

Written Comments relating to the ***Final Report, Environmental Assessment: Highway104 at Antigonish, April, 2005***, by Jacques Whitford Environment Limited, were received from the following:

1. Netukulimkewei'l Commission (Nova Scotia Native Council), as submitted by Mr. Roger Hunka, ***Environmental Assessment Report for Highway 104 Antigonish***, received June 13, 2005.

2. Compendium of Nova Scotia Provincial Government Department Responses, as submitted by Helen MacPhail of the Department of Environment and Labour, ***Provincial Agency Comments re: Environmental Assessment Report: Highway 104 at Antigonish***, received June 14, 2005.

3. Government of Canada responses, as submitted by Mark McLean of the Canadian Environmental Assessment Agency, ***Requests for more information under CEEA and federal comments under the Nova Scotia Environmental Assessment Review***, received June 14, 2005, and ***Highway 104 at Antigonish - Clarification on the Requests for more information under CEAA Review***, received June 28, 2005.

4. Municipality of the County of Antigonish, as submitted by Alan J. Bond, ***Final Draft Environmental Assessment, Highway 104, Antigonish***, received June 13, 2005.

The following documents were received by the Hearing Panel, and form part of the public record (available to the public at the Nova Scotia Department of Environment and Labour Library in Halifax and at the Department's Antigonish office):

1. Intervener Presentation of St. Ninian's Cemetery Care Company Antigonish, NS, as submitted by John Chisholm, received June 10, 2005.

2. Intervener Presentation of Blue Route Re-alignment Committee, as submitted by Hugh L. MacDougall, received June 13, 2005.

3. Intervener Presentation of James Fraser Dunn, submitted by same, ***THE ENVIRONMENTAL ASSESSMENT FOR HIGHWAY 104 AT ANTIGONISH*** (with supporting photographs and illustration), received June 13, 2005.

4. Follow-up Correspondence relating to the public hearings from Elizabeth Pugh, the Nova Scotia Department of Transportation and Public Works, ***Highway 104 at Antigonish***, received July 4, 2005.

5. Closing arguments relating to the public hearings from James Fraser Dunn, ***Environmental Assessment Board Highway 104 Panel Hearings at Antigonish***, received July 7, 2005.

6. Correspondence from James Fraser Dunn, ***FOLLOW-UP FROM JUNE 23, 2005 ANTIGONISH HEARING***, received July 11, 2005.

7. Correspondence Melinda Donovan, Navigable Waters Protection Program, Transport Canada, ***Highway No. 104 By-pass at Antigonish from Addington Forks Road to Taylor Road, Antigonish County, Province of Nova Scotia***, received July 12, 2005.

5. Correspondence from James Fraser Dunn, ***Comments on Proponents Undertaking List Received July 7, 2005***, received July 14, 2005.

9. Correspondence from Elizabeth Pugh, the Nova Scotia Department of Transportation and Public Works, ***Highway 104 at Antigonish Comments on Transcript***, received July 14, 2005.

10. Correspondence from Dwayne Cross, the Nova Scotia Department of Transportation and Public Works, relating to James Fraser Dunn's correspondence received on July 7, 2005 and July 11, 2005, ***Highway 104 at Antigonish EA - Public Hearings Submission from Mr. James Fraser Dunn***, received July 18, 2005.

11. Correspondence from Dwayne Cross, the Nova Scotia Department of Transportation and Public Works, relating to James Fraser Dunn's correspondence received on July 14, 2005, received July 20, 2005.